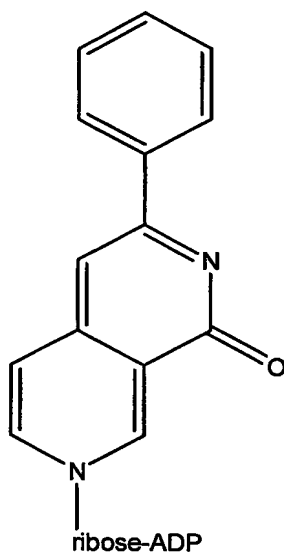


## CLAIMS

1. A compound having the structure of compound 1:



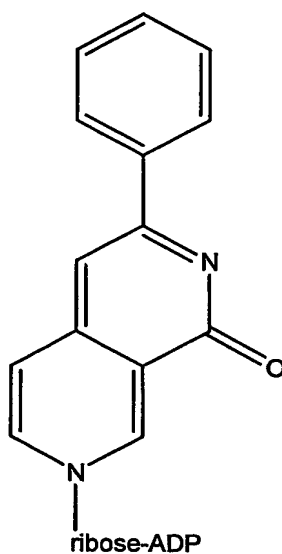
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- 5           2. A method of preparing the compound of claim 1, comprising:  
            mixing NAD<sup>+</sup> with acetophenone and base, to form a mixture; and  
            reacting the mixture with acid.
3. The method of claim 2, wherein the reacting comprises adding acid  
to the mixture and heating.
- 10          4. The method of claim 2, wherein the base is a solution of KOH.
5. The method of claim 2, wherein the acid comprises formic acid.

6. A method of detecting NAD<sup>+</sup>, comprising:  
converting NAD<sup>+</sup> to a fluorescent compound; and  
detecting the fluorescence of the fluorescent compound.

7. The method of claim 6, wherein the fluorescent compound is

5 compound 1:

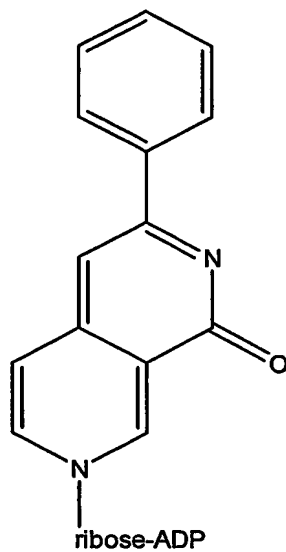


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8. The method of claim 6, wherein the converting comprises:  
mixing NAD<sup>+</sup> with acetophenone and base, to form a mixture; and  
reacting the mixture with acid.
9. The method of claim 8, wherein the base is a solution of KOH.
10. The method of claim 8, wherein the acid comprises formic acid.

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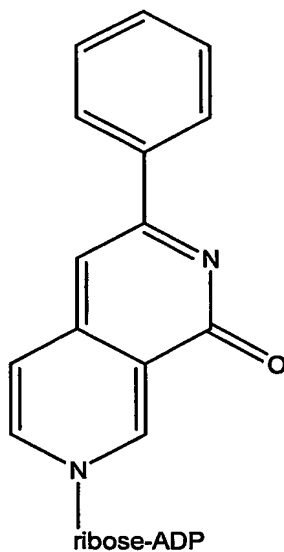
11. The method of claim 8, wherein the fluorescent compound is compound 1:



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5 12. A method of quantifying NAD<sup>+</sup>, comprising:  
converting NAD<sup>+</sup> to a fluorescent compound; and  
measuring an amount of fluorescence of the fluorescent compound.

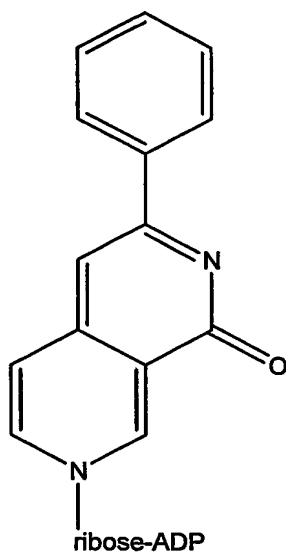
13. The method of claim 12, wherein the fluorescent compound is compound 1:



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14. The method of claim 12, wherein the converting comprises:  
mixing NAD<sup>+</sup> with acetophenone and base, to form a mixture; and  
reacting the mixture with acid.
15. The method of claim 14, wherein the base is a solution of KOH.
16. The method of claim 14, wherein the acid comprising formic acid.

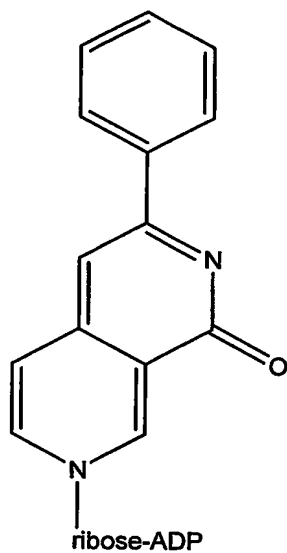
17. The method of claim 14, wherein the fluorescent compound is compound 1:



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- 5 18. A method of detecting an NAD<sup>+</sup> utilizing enzyme, comprising:  
incubating the enzyme with NAD<sup>+</sup> and a substrate for the enzyme;  
quantifying any remaining NAD<sup>+</sup> by the method of claim 12.

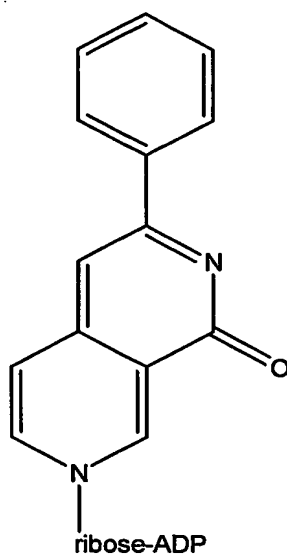
19. The method of claim 18, wherein the fluorescent compound is compound 1:



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20. The method of claim 18, wherein the converting comprises:  
mixing NAD<sup>+</sup> with acetophenone and base, to form a mixture; and  
reacting the mixture with acid.
21. The method of claim 20, wherein the base is a solution of KOH.
22. The method of claim 20, wherein the acid comprises formic acid.

23. The method of claim 20, wherein the fluorescent compound is compound 1:



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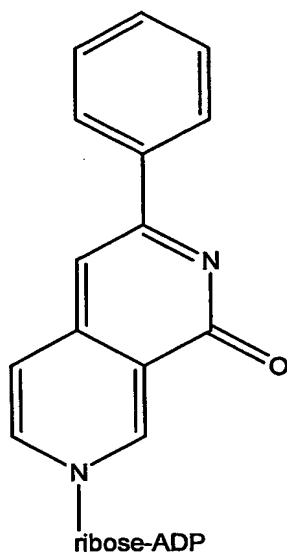
24. The method of claim 18, wherein the enzyme is PARP.

25. A method of determining whether a compound is an inhibitor of an NAD<sup>+</sup> utilizing enzyme, comprising:

comparing an amount of NAD<sup>+</sup> consumed during reaction of the enzyme with a substrate for the enzyme, with and without the compound;

wherein the amount of NAD<sup>+</sup> not consumed is measured by the method of claim 12.

26. The method of claim 25, wherein the fluorescent compound is compound 1:

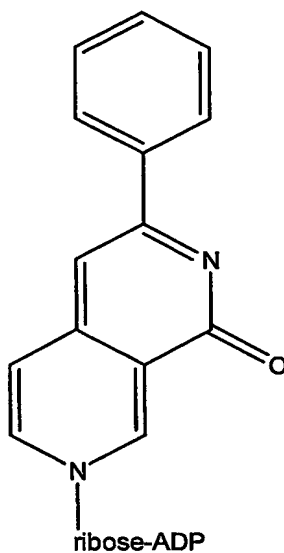


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27. The method of claim 25, wherein the converting comprises:  
mixing NAD<sup>+</sup> with acetophenone and base, to form a mixture; and  
reacting the mixture with acid.
28. The method of claim 27, wherein the base is a solution of KOH.
29. The method of claim 27, wherein the acid comprises formic acid.



30. The method of claim 27, wherein the fluorescent compound is compound 1:



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5 31. The method of claim 25, wherein the enzyme is PARP.

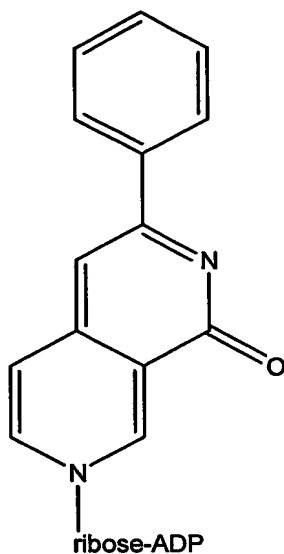
32. The method of claim 27, wherein the enzyme is PARP.

33. A method of detecting a genetic deficiency in an NAD<sup>+</sup> utilizing enzyme in a patient, comprising:

10 comparing an amount of NAD<sup>+</sup> consumed during reaction of an enzyme from the patient with a substrate for the enzyme, with an amount of NAD<sup>+</sup> consumed during reaction of a control enzyme with the substrate;

wherein the amount of NAD<sup>+</sup> not consumed is measured by the method of claim 12.

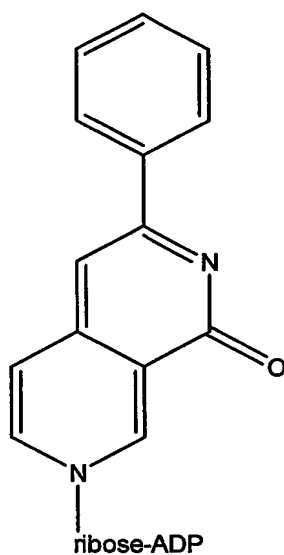
15 34. The method of claim 33, wherein the fluorescent compound is compound 1:



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35. The method of claim 33, wherein the converting comprises:  
mixing NAD<sup>+</sup> with acetophenone and base, to form a mixture; and  
reacting the mixture with acid.
36. The method of claim 35, wherein the base is a solution of KOH.
37. The method of claim 35, wherein the acid comprises formic acid.

38. The method of claim 35, wherein the fluorescent compound is compound 1:



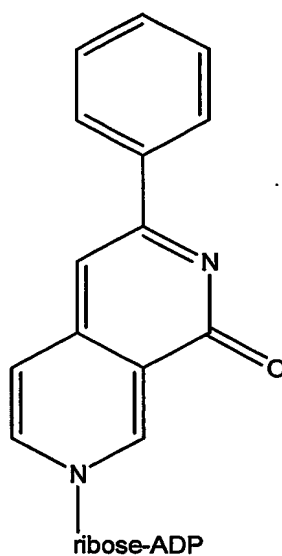
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39. The method of claim 33, wherein the NAD<sup>+</sup> utilizing enzyme is long-chain 3-hydroxyacyl-CoA dehydrogenase.

40. A kit for detecting NAD<sup>+</sup>, comprising:  
a base,  
acetophenone; and  
an acid.

41. The kit of claim 40, wherein  
the base is a solution of KOH, and  
the acid comprises formic acid.

42. A kit of claim 40, further comprising a solution containing a known amount of compound 1:



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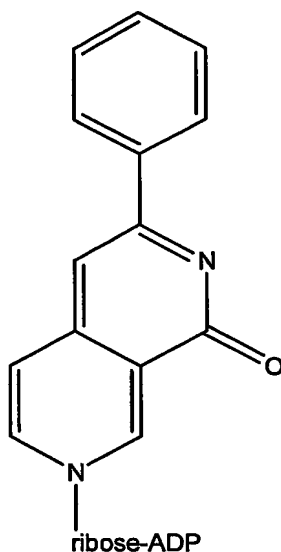
43. A kit of claim 40, further comprising NAD+.

44. A kit for quantifying NAD<sup>+</sup>, comprising:  
a base,  
acetophenone;  
an acid; and  
a standard.

45. A kit of claim 44, wherein the standard is a solution containing a

10 known amount of NAD+.

46. A kit of claim 44, wherein the standard is a solution containing a known amount of compound 1:

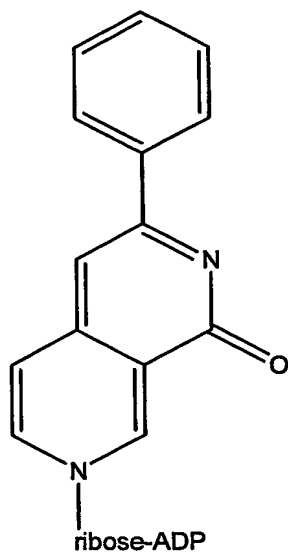


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- 5            47. The kit of claim 44, wherein  
the base is a solution of KOH, and  
the acid comprises formic acid.
48. A kit for measuring the activity of an NAD<sup>+</sup> utilizing enzyme,  
comprising:
- 10            a base,  
acetophenone;  
an acid; and  
a solution containing a known amount of the NAD<sup>+</sup> utilizing  
enzyme.
- 15           49. The kit of claim 48, wherein  
the base is a solution of KOH, and

the acid comprises formic acid.

50. A kit of claim 48, further comprising a solution containing a known amount of compound 1:



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51. A kit of claim 48, further comprising NAD<sup>+</sup>.

52. A kit of claim 48, wherein the NAD<sup>+</sup> utilizing enzyme is PARP.

53. A kit of claim 48, wherein the NAD<sup>+</sup> utilizing enzyme is long-chain 3-hydroxyacyl-CoA dehydrogenase.

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